

OLEVEL P2

A21 DAILY MATHS

- 1 Mr Smith bought three companies, Alpha, Beta and Gamma, for a total of \$80 000 000.

The amounts he paid for these companies were in the ratio 4 : 5 : 7.

- (a) Calculate how much he paid for each company. [2]

- (b) When he sold the companies, he made a profit of 12% on the \$80 000 000 he paid for them.

Calculate the profit he made on the sale of the three companies. [1]

- (c) When he sold the companies, he made a profit of 25% on Alpha and a loss of 10% on Beta.

Calculate

- (i) the profit he made on Alpha, [1]

- (ii) the percentage profit that he made on Gamma. [3]

- (d) When the previous owner, Mr Jones, sold the companies to Mr Smith for \$80 000 000, he made a profit of 60%.

Calculate the total amount Mr Jones had paid for the companies. [2]

- 2 (a) Two varieties of tea, 'High Blend' and 'Normal Blend', are made by mixing Grade A leaves and Grade B leaves.

- (i) In High Blend, the ratio of the masses of Grade A leaves to Grade B leaves is 3 : 2.

Find the mass of Grade A leaves used in making 250 g of High Blend. [1]

- (ii) 1 kg of Normal Blend is made by using 450 g of Grade A leaves.

Find, **in its simplest form**, the ratio of the masses of Grade A to Grade B leaves in Normal Blend.

Give your answer in the form $m : n$, where m and n are integers. [2]

- (iii) 250 g of High Blend is mixed with 1 kg of Normal Blend.

Calculate the percentage of the mass of this mixture that consists of Grade A leaves. [2]

- (b) During a sale, a shop sold packets of tea for 20% less than the price shown on their labels. Elizabeth and Peter each bought a packet of tea in the sale.

- (i) Elizabeth's packet had a label price of \$4.50.

How much did she pay? [1]

- (ii) Peter paid \$6.20 for his packet.

Calculate the price shown on its label. [2]

(a) These are the prices for a ride in an amusement park.

Adult	\$3.60
Child	\$2.25

- (i)** A family of two adults and three children went on the ride.
They paid with a \$20 note.

Calculate the change they received.

[1]

- (ii)** Express \$2.25 as a percentage of \$3.60.

[1]

- 4 James and Dan are partners in a small company.
From each year's profit, James is paid a bonus of \$15 000 and the remainder is shared between James and Dan in the ratio 2 : 3.
- (a) In 1996 the profit was \$20 000.
Show that Dan's share was \$3000. [1]
- (b) In 1997 the profit was \$21 800.
Calculate
(i) the percentage increase in the profit in 1997 compared to 1996, [2]
(ii) the total amount, including his bonus, that James received in 1997. [2]
- (c) In 1998 Dan received \$7500.
Calculate the profit in 1998. [3]
- (d) In 1999, the profit was \$ x , where $x > 15\,000$.
(i) Write down an expression, in terms of x , for the amount Dan received. [1]
(ii) Given that Dan received half the profit, write down an equation in x and hence find the amount that Dan received. [3]

- 5 (a) One day the rate of exchange between pounds (£) and United States dollars (\$) was £1 = \$1.65.
On the same day, the rate of exchange between pounds (£) and euros was £1 = 1.44 euros.
- (i) Alan changed £500 into dollars.
Calculate how many dollars he received. [1]
- (ii) Brenda changed 900 euros into pounds.
Calculate how many pounds she received. [1]
- (iii) Clare changed \$792 into euros.
Calculate how many euros she received. [2]
- (b) The cost of manufacturing a television was \$15 000.
- (i) It was sold to a wholesaler at a profit of 8% of the cost.
Calculate the price the wholesaler paid for the television. [1]
- (ii) The wholesaler sold the television to a shop at a profit of 8% of the price he paid for it.
The shop then sold the television to John at a profit of 8% of the price it paid.
Calculate how much the television cost John. [2]
- (iii) Calculate the percentage increase in the cost of the television from its manufacture till John owns it. [2]
- (c) The shop sold a Home Entertainment system to Leslie for \$46 480. The shop made a profit of 12% on the price it paid for the system.
Calculate how much the shop paid for the system. [2]

- 6 (a) The table shows the fares charged by a taxi company.

\$1.20 per kilometre for the first 10 km then 80 cents for each additional kilometre after the first 10 km
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- (i) Calculate the fare for a journey of

(a) 8 km, [1]

(b) 24 km. [1]

- (ii) Find the length of the journey for which the fare was \$16. [2]

- (b) The table gives the times of high tides at a harbour.

Date	May 5	May 6	May 7
Times	10 00	11 20	00 36
	22 56		12 50

- (i) Calculate, in hours and minutes, the length of time between the high tide on May 6 and the morning high tide on May 7. [1]

- (ii) Given that low tides occurred midway between high tides, calculate the time of the low tide on the afternoon of May 5. [2]

- (c) The height of a mountain is 1800 metres.

It is suggested that this mountain has been worn away at an average rate of 0.15 mm per year.

Assuming that the suggestion is correct, calculate the height of the mountain 20 million years ago. [2]

- 7 **(a)** In 2005, the cost of posting a letter was 28 cents.
A company posted 1200 letters and was given 4% discount on the cost.
- Calculate the total discount. [1]
- (b)** In 2006, the cost of posting a letter was increased from 28 cents to 35 cents.
- Calculate the percentage increase in the cost of posting a letter. [2]
- (c)** After the price increase to 35 cents, the cost to the company of posting 1200 letters was \$399.
- Calculate the percentage discount that the company was given in 2006. [2]
- (d)** In 2006, it cost \$4.60 to post a parcel.
This was an increase of 15% on the cost of posting the parcel in 2005.
- Calculate the cost of posting this parcel in 2005. [3]

- 8 (a) Anne's digital camera stores its images on a memory card.
The memory card has 128 units of storage space.
When 50 images were stored, there were 40 units of **unused** storage space on the memory card.
- (i) Calculate the percentage of **unused** storage space on the memory card. [1]
- (ii) Calculate the average amount of storage space used by each image. [2]
- (b) Shop A charged 60 cents for each photograph.
Shop B charged 63 cents for each photograph and gave a discount of \$1 on all purchases more than \$10.
- (i) Anne bought 24 photographs from Shop A and paid with a \$20 note.
Calculate the change she received. [1]
- (ii) Find how much cheaper it was to buy 24 photographs from Shop B than from Shop A. [2]
- (iii) Find the smallest number of photographs for which it was cheaper to use Shop B. [2]

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- 9 (a) On average, Jim's heart beats 75 times per minute.

Calculate the number of times his heart beats during 50 weeks.
Give your answer in standard form.

[2]

- (b) After an exercise, Ali and Ben measured their heart rates.

The ratio of their heart rates was 15:17.

Ben's heart beat 18 times per minute more than Ali's.

Calculate Ali's heart rate.

[2]

- (c) The recommended maximum heart rate, H , for a man during exercise, is given by the formula

$$H = \frac{4}{5} (220 - n),$$

where n years is the age of the man.

- (i) Calculate H when $n = 25$.

[1]

- (ii) Calculate n when $H = 144$.

[1]

- (iii) Make n the subject of this formula.

[2]

10 (a) In 2006 the cost of fuel was 91.8 cents per litre.

(i) Calculate the maximum number of whole litres that could be bought for \$15. [1]

(ii) In 2007 the cost of fuel was increased by 4 cents per litre.

(a) Calculate the percentage increase in the cost of fuel in 2007. [2]

(b) On average, a car travelled 21 km on 1 litre of fuel.

During 2006 this car travelled 19 200 km.

In 2007 the car travelled the same distance.

Calculate the extra cost for fuel in 2007.

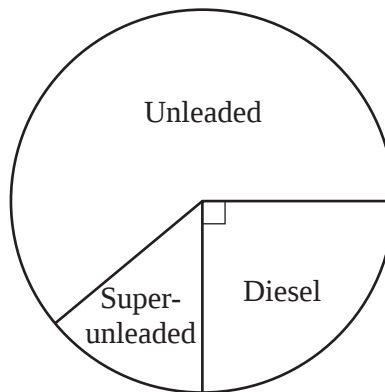
Give your answer to the nearest dollar. [2]

(iii) In 2006 the cost of fuel was 10% less than the cost in 2005.

Calculate the cost, in cents, per litre in 2005. [2]

(b) A service station sells unleaded, super-unleaded and diesel fuel.

The pie chart represents the amounts of these fuels sold during one week.



The total amount of fuel sold during this week was 54 000 litres.

(i) How many litres of diesel were sold? [1]

(ii) The amount of unleaded fuel sold was $\frac{2}{3}$ of the total for the week.

How many litres of super-unleaded fuel were sold? [2]

11 (a) During a 20 week period in 2007, a bank made a profit of \$378 million.

(i) Calculate the average profit it made each second. [2]

(ii) During the same 20 week period in 2008, the profit was \$945 million.

For this 20 week period, calculate the percentage increase in the profit from 2007 to 2008. [2]

(iii) Find the ratio of \$378 million to \$945 million.

Give your answer in the form $m : n$, where m and n are the smallest possible integers. [2]

(b) Mary changed 480 euros into dollars.

The exchange rate was \$1 = 0.6 euros.

The bank took, as commission, 2% of the amount that had been changed.

Calculate the number of **dollars** the bank took as commission. [2]

- 12 (a) 100 g of spaghetti contains 3.6 g of fibre.

Express

mass of fibre : mass of spaghetti

as the ratio of two integers in its simplest form.

[1]

- (b) A tin contains 210 g of beans.

- (i) 100 g of beans contains 4.5 g of protein.

Calculate the mass of protein in the tin.

[1]

- (ii) 100 g of beans contains 0.3 g of fat.

- (a) What percentage of the beans is fat?

[1]

- (b) The recommended daily amount of fat is 70 g.

Calculate what percentage of the recommended daily amount is in the tin.

[3]

- (iii) The mass of salt in 100 g of beans is 1.0 g, correct to 1 decimal place.

Calculate an upper bound for the mass of salt contained in the tin.

[2]

- (c) A tin of soup contains 166 calories.

This is 8.3% of the recommended daily number of calories.

Calculate the recommended daily number of calories.

[2]

13 Wasim owns a shop.

The table shows the cost price and selling price of three items in his shop.

Item	Cost Price (\$)	Selling Price (\$)
Trampoline	48	66
Swing	x	19.50
Bicycle	82	110

(a) Calculate his percentage profit when he sells a trampoline. [2]

(b) Wasim makes a profit of 30% when he sells a swing.

Calculate the cost price, $\$x$, of a swing. [3]

(c) In a sale, the selling price of a bicycle is reduced by 20%.

(i) Find the sale price of a bicycle. [1]

(ii)

THURSDAY SPECIAL

Save 10% off the **sale price**.

Jaspreet bought a bicycle on a Thursday.

Calculate the difference between the amount Jaspreet paid and the cost price. [2]

- 14 (a) Sarah bought some soup, apples and mushrooms from her local shop.
The table shows some of the amounts and prices.

Items	Price (\$)
p cans of soup at 90 cents per can	6.30
1.5 kilograms of apples at \$ q per kilogram	4.35
r kilograms of mushrooms at \$6.40 per kilogram	1.60

- (i) Find the values of p , q and r . [2]

- (ii) Sarah gives the shopkeeper \$20.00 to pay for all these items.

How much change does she receive? [1]

(b)

Washing Machine \$980	<u>Finance offer</u> Pay a 20% deposit <u>and</u> 24 monthly payments of \$36 each
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Lavin decides to buy this washing machine.

How much more would it cost Lavin if he paid for the washing machine using the finance offer instead of paying the \$980 immediately? [2]

- (c) Asif deposits \$650 into a bank paying simple interest.
He leaves the money there for 5 years.
At the end of the 5 years, the amount in the bank is \$763.75.

Calculate the percentage rate of interest the bank paid per year. [3]

- 15 Archie bought a car from a dealer.
The dealer sold the car for \$7040.
Archie paid a deposit of \$1760.

(a) Calculate the deposit as a percentage of the dealer's selling price. [1]

(b) Archie took out a loan agreement to repay the outstanding balance of \$5280.
He paid \$212.67 per month for 36 months.

Calculate

(i) the amount of interest that he paid, [2]

(ii) the rate of simple interest per year that had been charged. [3]

(c) When the dealer sold the car, he made a profit of 30%.

Calculate the profit, correct to the nearest dollar, that the dealer made on the sale of this car. [3]

- 16 (a) Ahmed's internet provider offers two payment schemes.

Scheme A : \$30 per month for unlimited use.

Scheme B : \$0.05 per minute on weekdays and \$0.03 per minute at the weekend.

Each month Ahmed uses the internet for a **total** of $5\frac{1}{4}$ hours at the weekday rate and a **total** of 12 hours at the weekend rate.

Find the cost per month, in dollars, for Scheme B and decide which payment scheme is cheaper.

Answer Scheme B costs \$.....

Schemeis cheaper [2]

- (b) Ahmed's printer can use large or small black cartridges.

A large cartridge costs \$48.50 and prints 1000 pages.

A small cartridge prints 650 pages.

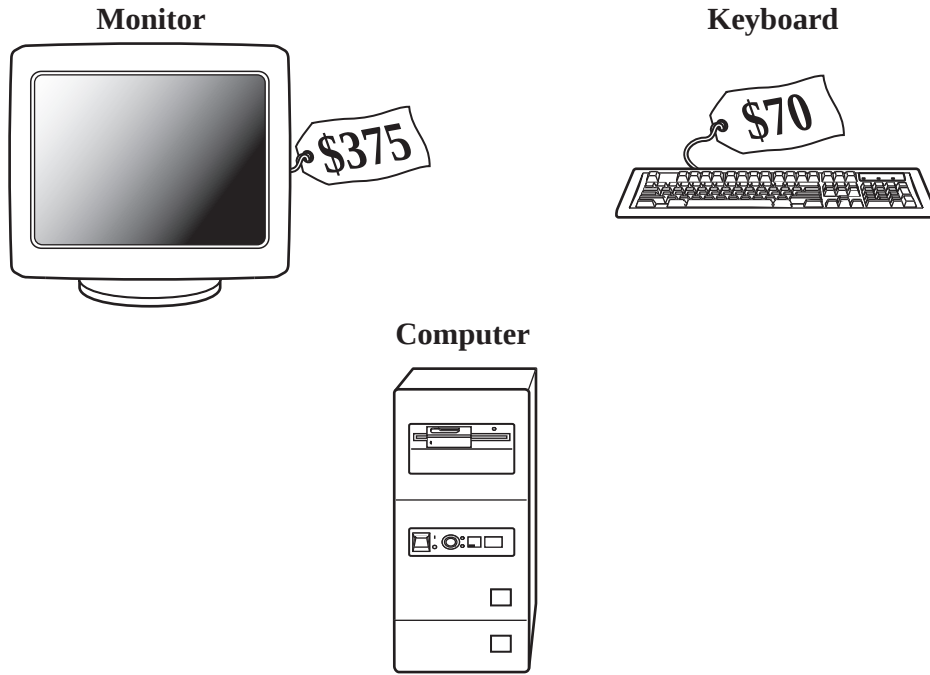
2 small cartridges cost \$65.

- (i) Find the cost per page, in dollars, if Ahmed buys 2 small cartridges.

Answer \$ [1]

- (ii) Is it cheaper per page for Ahmed to buy 2 small cartridges or a large cartridge?
Show your working.

(c)



Ahmed buys a new monitor, keyboard and computer.
He is given a 15% discount off the total price.
The discounted price that Ahmed pays is \$1134.75.
The price of the monitor before the discount was \$375.
The price of the keyboard before the discount was \$70.

Calculate the price of the computer before the discount.

Answer \$..... [3]

17(a)

Exchange Rate

$$\text{\$1} = \text{£0.45}$$

Jean-Pierre bought a watch for \$110.

Simon bought an identical watch for £46.62.

Find the difference, in dollars, between the amount Jean-Pierre paid and the amount Simon paid.

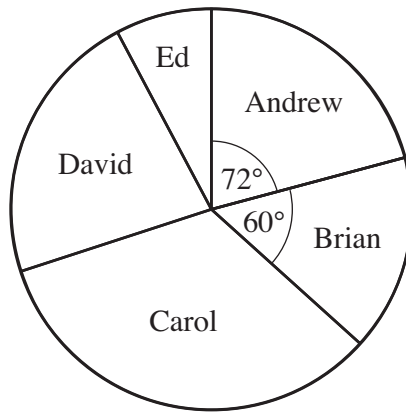
Answer \$..... [2]

- (b) The time taken to build a brick wall is inversely proportional to the number of workers.
3 workers took 30 hours to build a wall.

Calculate the time it would have taken 5 workers to build this wall.

Answer hours [2]

- 18 The pie chart, not drawn accurately, represents the weekly income of the five employees in a small British company in 2009.



Andrew's weekly income is represented by a sector with an angle of 72° .
Brian's weekly income is represented by a sector with an angle of 60° .

- (a) Andrew's weekly income was £270.

Find the total weekly income of the five employees.

Answer £ [1]

- (b) Calculate Brian's weekly income.

Answer £ [1]

- (c) Carol's weekly income was £405.

Calculate the angle of the sector representing Carol's weekly income.

Answer [1]

- (d) David's weekly income was twice as much as Ed's weekly income.

Calculate David's weekly income.

Answer £ [2]

- (e) Andrew paid 20% of his weekly income of £270 as tax.
He also paid 6% of his weekly income of £270 towards his pension.

How much of his weekly income did he have left after paying tax and pension?

Answer £ [2]

- (f) Carol paid 20% of her weekly income of £405 as tax.
She also paid $x\%$ of her weekly income towards her pension.
She then had £287.55 of her weekly income left.

Find x .

Answer [3]

- (g) Andrew's weekly income of £270 in 2009 was 8% more than his weekly income in 2008.

Find his weekly income in 2008.

Answer £ [2]

19(a) Ada and Bill own a company.

In 2008 Ada invests \$22 500 in the company and Bill invests \$37 500.

- (i) Express $22\,500 : 37\,500$ in the form $m : n$, where m and n are the smallest possible integers.

Answer : [1]

- (ii) The profit made by the company in 2008 is shared in the ratio of the amounts invested.

Given that Ada's share of the profit is \$3 600, calculate the total profit made by the company.

Answer \$..... [1]

- (iii) Ada's investment in 2008 is $12\frac{1}{2}\%$ more than the amount she invested in 2007.

Calculate the amount that Ada invested in 2007.

Answer \$..... [2]

(b)

LAWNMOWER \$2395		Plan A: Deposit \$595 and 12 monthly payments of \$171.04 Plan B: Deposit \$395 and 24 monthly payments of \$
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- (i) Rashid buys one of these lawnmowers for \$2395.
Sayeed buys one of these lawnmowers using Plan A.

In total, how much **more** than Rashid will Sayeed pay?

Answer \$..... [1]

- (ii) When one of these lawnmowers is bought using Plan B, the total cost is \$3054.20.

Calculate the monthly payment.

Answer \$..... [2]

- (iii) In a sale, the price of the lawnmower is reduced from \$2395 to \$1595.

Calculate the percentage discount.

Answer % [2]

20 (a) A shopkeeper buys some plates from a manufacturer for \$10 each.

(i) (a) The shopkeeper sells a plate for \$12.

Calculate the percentage profit.

Answer% [1]

(b) The shopkeeper buys 240 plates and sells 180 at \$12 each.
The rest were sold to a café for a total of \$540.

Calculate the percentage discount given to the café.

Answer% [2]

(ii) The manufacturer made a profit of 60% when he sold each plate for \$10.

Calculate the cost of manufacturing each plate.

Answer \$..... [2]

- (b) Another shopkeeper bought 100 pans at \$5 each.
He sold 63 at \$6 each and x at \$4 each.
He did not sell all the pans nor enough to make an overall profit.

(i) Form an inequality in x .

Answer [1]

(ii) Hence find the greatest possible number of pans that were sold.

Answer [2]

- (c) One day, the rate of exchange between American dollars (\$) and British pounds (£) was $\$1.45 = \pounds 1$.

(i) Alan changed £300 into dollars.

Calculate how many dollars he received.

Answer \$..... [1]

(ii) On the same day, the rate of exchange between South African rands (R) and pounds was $\text{R}10.44 = \pounds 1$.

Calculate the number of rands received in exchange for one dollar.

Answer R..... [2]

- 21 (a) Sunil needs to hire a digger from Monday to Thursday one week and on Monday and Tuesday the following week.

The Hire company charges \$48 each time the digger is hired plus \$13 per day.

He has two options.

Option 1: Hire the digger for four days, return it and then hire it again for two days.

Option 2: Hire it continuously from the first Monday to the second Tuesday.

Which is the cheaper option and by how much?

Answer Option is cheaper by \$ [2]

- (b) Tina invests some money in an account that earns simple interest at 3% per year.

At the end of one year the investment is worth \$2781.

How much money did she invest?

Answer \$..... [2]

22 Matthew makes pieces of furniture and sends them to a shop where they are sold. When a piece is sold, the shopkeeper receives 15% of the selling price, and Matthew receives the rest.

(a) A table is sold for \$200.

(i) Calculate the amount the shopkeeper receives.

Answer \$ [1]

(ii) The cost of making this table was \$131.80.

Calculate the percentage profit that Matthew makes when this table is sold.

Answer % [3]

(b) Matthew made a bookcase.

The cost of making the bookcase was \$647.50.

After the bookcase is sold and the shopkeeper has received 15% of the selling price, Matthew makes a profit of \$160.

Calculate the selling price of the bookcase.

Answer \$[3]

4024/21/O/N/12

23 (a) In 2009 the cost of posting a letter was 36 cents.

(i) A company posted 3000 letters and was given a discount of 4%.

Calculate the total discount given.
Give your answer in dollars.

Answer \$ [1]

(ii) In 2010, the cost of posting a letter was increased from 36 cents to 45 cents.

Calculate the percentage increase.

Answer% [2]

(iii) After the price increase to 45 cents, the cost to the company of posting 3000 letters was \$1302.75.

Calculate the new percentage discount given.

Answer% [2]

(b) In 2010, it cost \$5.40 to post a parcel.

This was an increase of $12\frac{1}{2}\%$ on the cost of posting the parcel in 2009.

Calculate the increase in the cost of posting this type of parcel in 2010 compared to 2009.

Answer \$ [3]

Exchange rate

$$\text{\$ } 1 = \text{\text{€}} 0.72$$

Eddie travels from the USA to Germany.
He changes \$300 into euros (€).

How many euros does he receive?

Answer €..... [1]

(ii) When Eddie returns to the USA he has €51 left that he exchanges for \$75.

What exchange rate has been used in this case?

Answer \$1 = € [1]

- (b) Greg buys 60 garden plants at a cost price of \$2.00 each to sell in his shop.
He sells 25 of them at a profit of 75% and 18 of them at a profit of 35%.
He sells the rest of the plants for $\frac{4}{5}$ of the cost price.
- (i) Calculate the profit or loss he makes from selling these 60 plants, stating if it is a profit or loss.

Answer Greg makes a of \$. [3]

- (ii) Find the percentage profit or loss.

Answer % [1]

25 (a) (i)

Exchange rate $\text{£}1 = \$2.06$ $\text{£}1 = 72 \text{ rupees}$
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Manraj changes 25 200 rupees into dollars (\$).

Calculate how many dollars he receives.

Answer \$..... [2]

- (ii) Misja changes 380 euros into dollars (\$).
He receives \$551.

How many dollars does he receive for each euro?

Answer 1 euro = \$ [1]

(b)

Account	Simple interest per year
Super Saver	3.4%
Extra Saver	3.5%

On 31 March 2011, Lydia and Simone each had \$8000 in an account.
Lydia's money is in a Super Saver Account. Simone's money is in an Extra Saver Account.

- (i) How much money did Lydia have in her account on 31 March 2012 after the interest had been added?

Answer \$..... [2]

- (ii) On 31 March 2012, Lydia transferred this money to an Extra Saver Account.
How much money did she have in this account on 31 March 2013 after the interest had been added?

Answer \$..... [1]

- (iii) Simone kept her money for the two years in the Extra Saver Account, which earned simple interest of 3.5% per year.
After all interest had been added, who had more money in their account on 31 March 2013 and by how much?

Answer had \$ more [2]

26(a) A shop buys the posts from a manufacturer and sells them at a profit of 30%.
The shop sells each post for \$35.10.

- (i) How much does each post cost from the manufacturer?

Answer \$..... [2]

(ii)

Fence panels	\$50.70 each
Posts	\$35.10 each

Mr Chan buys 4 fence panels and 5 posts.

He hires a builder to put up the fence.

The builder charges 220% of the total cost of the fence panels and posts to do the work.

What is the total amount Mr Chan pays for his fence?

Answer \$..... [3]

27 a) The rate of exchange between dollars (\$) and pounds (£) is $\$1.56 = \pounds 1$.
The rate of exchange between euros (€) and pounds is $\text{€}1.10 = \pounds 1$.

- (i)** Amy changes £300 into dollars.

Calculate how many dollars Amy receives.

Answer \$ [1]

- (ii)** Ben changes €770 into pounds.

Calculate how many pounds Ben receives.

Answer £ [1]

- (iii)** Chris changes \$780 into euros.

Calculate how many euros Chris receives.

Answer € [2]

- (b) Debbie changed some dollars into Japanese yen.
The rate of exchange was 81 dollars = 1 yen.

Emma changed the same number of dollars into yen.
The rate of exchange for Emma was 82 dollars = 1 yen.

Emma received 3 fewer yen than Debbie.

Given that the number of dollars changed each time is x , find x .

Answer [3]
4024/21/O/N/13

- 28 a) (i) The cost price of bicycle A is \$620.
The shopkeeper sells it and makes a profit of 45%.

Calculate the selling price.

Answer \$..... [1]

- (ii) In a sale, the price of bicycle B is reduced from \$2400 to \$1596.

Calculate the percentage reduction given.

Answer% [2]

- (iii) Tax on the original price of bicycle C is charged at 20% of the original price.
After tax has been included, Matthew pays \$1080 for this bicycle.

Calculate the original price.

Answer \$..... [2]

- (b) Ada invests \$600 in an account that earns simple interest.
At the end of 3 years, the investment is worth \$681.

Calculate the rate of simple interest per year.

Answer% [3]

- 29 (a) Zara owns a hairdressing salon.
She buys a pack of 60 bottles of shampoo from a warehouse for \$240.
She plans to sell the bottles of shampoo to her customers for \$5.50 each.

(i) Calculate the percentage profit Zara makes on each bottle she sells for \$5.50 .

Answer [2]

(ii) Zara sells 45 bottles at the full price then sells the rest with a 20% discount.

Calculate the total profit she makes selling all 60 bottles.

Answer \$ [2]

(iii) When the warehouse sells a pack of shampoo for \$240 it makes a profit of 15%.

Calculate the price paid for the pack of shampoo by the warehouse.

Answer \$ [2]

(iv) Zara borrows \$2500 from a bank to make improvements to her salon.
She is charged 4.5% per year simple interest.
She pays the money back after 3 years.

Calculate the **total** amount Zara must pay to the bank.

Answer \$ [2]

- (b) The exchange rate between dollars (\$) and pounds (£) is $\$1 = \text{£}0.64$.
The exchange rate between dollars (\$) and euros (€) is $\$1 = \text{€}0.78$.

- (i) Luke changes \$250 into pounds.

Calculate how many pounds he receives.

Answer £ [1]

- (ii) Complete the statement to show the exchange rate between pounds and euros.

Exchange rate £1 = €
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[2]

- 30 (a)** Mariam works in a shop.
She earns \$5.20 per hour.
She also earns a bonus of 15% of the value of the items she sells in a week.

- (i)** In one week she works for 32 hours and sells items with a value of £2450.

Calculate Mariam's total earnings for the week.

Answer \$ [2]

- (ii)** In another week, Mariam worked for 28 hours and earned a total of \$409.60 .

Calculate the value of the items she sold that week.

Answer \$ [3]

- (b) (i)** Jack opens a bank account paying simple interest.
He pays in \$800 and leaves it in the account for 4 years.
At the end of 4 years he closes the account and receives \$920.

Calculate the percentage rate of simple interest paid per year.

Answer % [2]

- (ii)** Jack uses some of the \$920 to pay for a holiday and a computer.
He saves the remainder.
The money is divided between the holiday, computer and savings in the ratio 4 : 5 : 7 .

Calculate the amount he saves.

Answer \$ [2]

31 (a) The table shows some of the nutritional information for a 300 g tin of soup.

Carbohydrate	18 g
Fat	20.1 g
Fibre	0.6 g
Sodium	1.38 g

(i) What percentage of the 300 g tin of soup is carbohydrate?

Answer % [1]

(ii) What fraction of the 300 g tin of soup is fibre?
Give your answer as a fraction in its lowest terms.

Answer [1]

(iii) Of the carbohydrates, 15% are sugars.
How many grams of sugars are in one tin of soup?

Answer g [1]

(b) I need 2500 g of soup.
How many 300 g tins of soup do I need to buy?

Answer [1]

(c) During March there is a special promotion and the soup is on sale in tins containing 20% extra.

(i) These tins of soup each contain 4.2 g of protein.

How much protein was contained in each original 300 g tin of soup?

Answer g [2]

(ii) The special promotion tins cost \$0.80 .

The soup can also be bought in larger tins containing 500 g for \$1.12 .

Is it better value to buy the 500 g tin or the special promotion tin?

Show your working.

32 Hendrik travels by plane from London to Bangkok.
When it is 04 00 local time in London it is 10 00 local time in Bangkok.

(a) The flight takes 11 hours and 15 minutes.

If he leaves London at 21 50 local time, what is the local time in Bangkok when he arrives?

Answer [2]

(b) On his return journey, Hendrik leaves Bangkok at 07 45 local time and arrives back in London on the same day at 13 40 local time.

How long was his return flight?

Answer hours minutes [2]

(c) The graph opposite shows the exchange rate between British Pounds (£) and Thai Baht (THB) on the day Hendrik arrives in Bangkok.

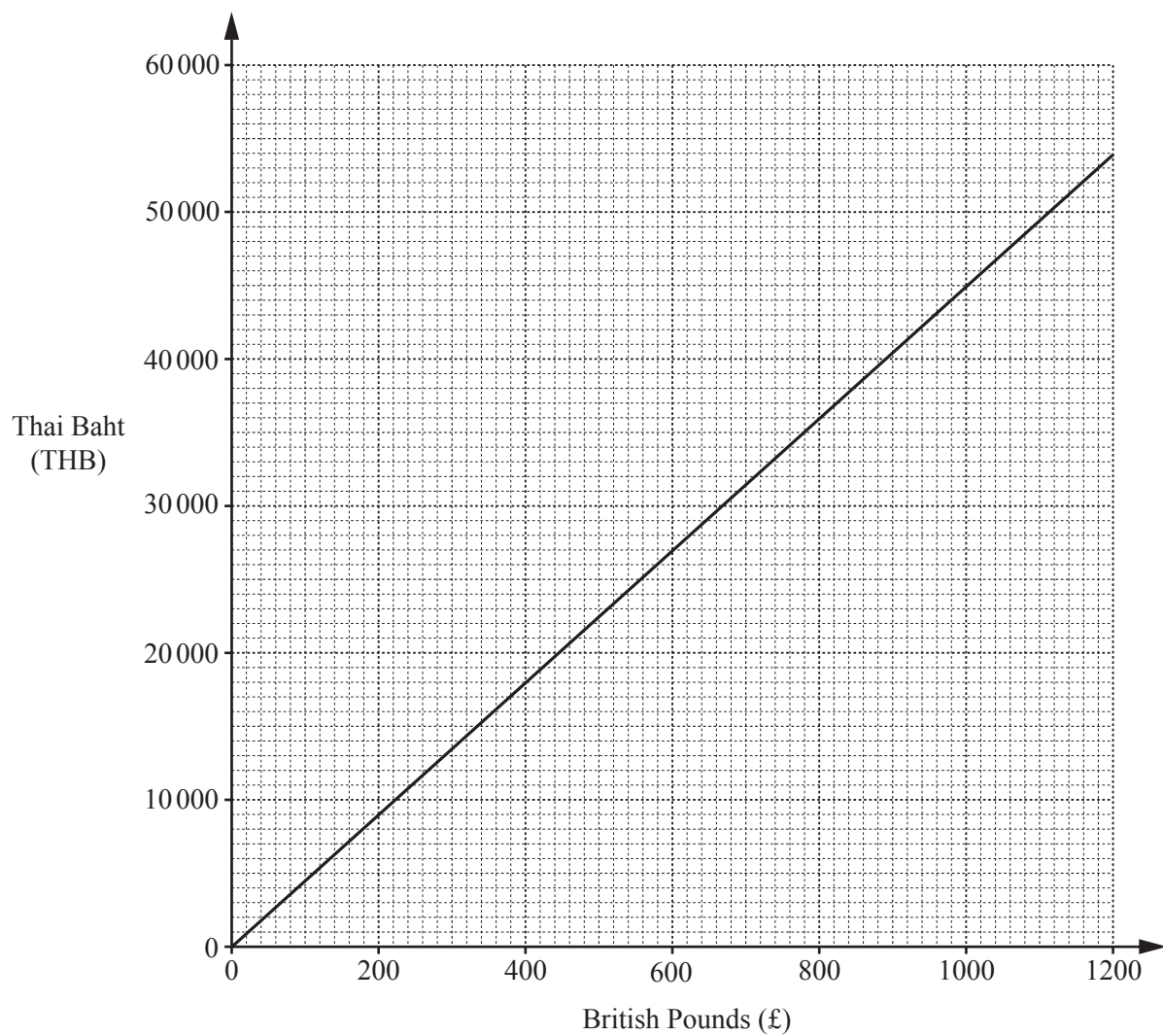
(i) Use the graph to estimate the cost in British Pounds of an item costing 13 000 THB.

Answer £ [1]

(ii) The exchange rate can be written as £1 = k THB.

Find k .

Answer [1]



- (d) The cost of flights from London to Bangkok is shown in the table below.
 For this cost, passengers are allowed to take luggage up to the weight shown.
 Passengers taking more than this weight of luggage pay an excess charge at the rate shown.

	Cost of flight	Weight of luggage included	Charge per extra 1 kg
Business Class	£1932	30 kg	£24
Economy Class	£683	23 kg	£24

Calculate the total cost of Hendrik flying Economy Class from London to Bangkok with luggage weighing 29 kg.

Answer £ [2]

- 33 (a)** In 2013, Mary worked for Company A.
Her salary for the year was \$18 750.

- (i)** \$5625 of her salary was not taxed.

What percentage of her salary was not taxed?

Answer % [2]

- (ii)** The remaining \$13 125 of Mary's salary was taxed.
22% of this amount was deducted for tax.
Mary's take-home pay was the amount remaining from \$18 750 after tax had been deducted.
She received this in 52 equal amounts as a weekly wage.

Calculate Mary's weekly wage.

Answer \$ [3]

- (iii)** In 2012 Mary had worked for Company B.
When she moved from Company B to Company A, her salary increased by 25% to \$18 750.

Calculate her salary when she worked for Company B.

Answer \$ [2]

- (b) The rate of exchange between pounds (£) and Indian rupees (R) is £1 = R87.21.
The rate of exchange between pounds (£) and Swiss francs (F) is £1 = F1.53.
- (i) Mavis changed £750 into Indian rupees. How many rupees did she receive?

Answerrupees [1]

- (ii) David changed F450 into pounds. How many pounds did he receive?

Answer £ [1]

- (iii) Brian changed R50 000 into Swiss francs. How many Swiss francs did he receive?

Answerfrancs [2]

34 (a) A furniture salesman earned \$36 200 last year.

(i) He had to pay 22% of this amount as tax.

How much was left after paying tax?

Answer \$ [2]

(ii) His earnings of \$36 200 were made up of \$25 000 basic salary plus 8% of the value of the furniture that he sold.

Calculate the value of the furniture that he sold.

Answer \$ [3]

- (iii) He bought a bookcase from the shop where he worked.
Its marked price was \$1080 but because he worked there, he only paid \$756.

Calculate the percentage discount on the marked price that he had been given.

Answer% [2]

- (b) George opened an account and invested a sum of money at 4.5% simple interest per year for 3 years. At the end of the 3 years he closed the account, withdrawing a total of \$681.

Calculate the amount that George invested.

Answer \$ [3]

- 35 (a)** Yuvraj and Sachin travel to England.
Yuvraj exchanges 20 500 rupees and receives £250.
Sachin exchanges 26 650 rupees into pounds (£) at the same exchange rate.

How many pounds does Sachin receive?

Answer £ [2]

- (b)** Dan goes to a bank to exchange some pounds (£) for euros (€).
He has £400 which he wants to exchange.
The bank only gives euros in multiples of 5 euros.
The exchange rate is £1 = €1.17.

Find the number of euros he receives and his change from £400.

Answer Dan receives €.....

His change is £ [3]

- (c)** Kristianne buys a fridge and a freezer in a sale.
The sale offers 15% off everything and she pays a total of \$357.
Before the sale, the freezer cost \$250.

What was the cost of the fridge before the sale?

Answer \$ [3]

- 36 (a) Tim invests \$2500 in a bank paying simple interest at 2.3% per year.
What is the total amount of money in the bank at the end of 4 years?

Answer \$ [2]

(b)

TABLET

\$750

FINANCE OFFER

Pay 15% of \$750 as deposit and
36 monthly payments of \$25.

Chris buys the tablet using the finance offer.
How much more does he pay than if he had paid \$750 for it?

Answer \$ [2]

- (c) Lavin buys some sweets, pens and paper at her local shop.
The shop is offering 20% discount on all items.
This is her receipt.

Items and prices	Cost (\$)
0.3 kg of sweets at \$15.50 per kg	w
6 pens at \$ x per pen	4.50
Paper	z
Total before discount	y
Total after discount	32.40

Find the missing values w , x , y and z .

Answer $w =$

$x =$

$y =$

$z =$ [5]

37 (a) Fatima and Mohammed buy new bikes.

(i) Fatima buys a city bike costing \$360.
She pays 60% of the cost then pays \$15 per month for 12 months.

(a) How much does Fatima pay altogether?

Answer \$..... [2]

(b) Express this amount as a percentage of the original cost.

Answer % [1]

- (ii) Mohammed pays \$569.80 for a mountain bike in a sale.
The original price had been reduced by 26%.

Calculate the original price of the mountain bike.

Answer \$..... [2]

- (b) The rate of exchange between pounds (£) and dollars is £1 = \$1.87 .
The rate of exchange between pounds (£) and euros (€) is £1 = € x .
Rose changed \$850 and received €550 .

Calculate x .

Answer $x =$ [3]

38 A shopkeeper buys some plates from a manufacturer for \$12 each.

(a) The manufacturer makes a profit of 60%.

Calculate the cost of manufacturing each plate.

Answer \$ [2]

(b) The shopkeeper sells each plate for \$17.40.

Calculate the percentage profit made by the shopkeeper.

Answer% [2]

(c) In a sale, each plate is reduced from \$17.40 to \$11.31.

Calculate the percentage discount given.

Answer% [2]

- (d) The shopkeeper buys 100 plates at \$12 each.
He sells 60 plates at \$17.40 each and x plates at \$11.31 each.
The shopkeeper makes a profit of at least 10%.

Find the least possible value of x .

Answer [3]

- 39 (a)** Each year the Reds play the Blues in a baseball match.
In 2014, there were 40 500 tickets sold for the match.
In 2015, the number of tickets sold was 2.4% more than in 2014.

Calculate the number of tickets sold for the match in 2015.

Answer [1]

- (b)** In 2015, the cost per ticket for the match was \$68.25.
The cost per ticket for the match increased by 5% from 2014 to 2015.

Calculate the cost per ticket for the match in 2014.

Answer \$ [2]

- (c)** Calculate the percentage increase, from 2014 to 2015, in the total money taken for the match.

Answer % [3]

40 (a) In 2016, the price of a television is \$1995.

(i) Afzal pays the \$1995 with a deposit of \$399 and 12 equal monthly payments.

Calculate Afzal's monthly payment.

Answer \$ [1]

(ii) What percentage of \$1995 is \$399?

Answer % [1]

(iii) The price of the television in 2016 is 5% more than the price in 2015.

Calculate the price in 2015.

Answer \$ [2]

- (b) Afzal watched a programme that lasted 2 hours 53 minutes.
It ended at 01 15.

At what time did it start?

Answer [1]

- (c) A company paid a quarter of a million dollars for an advertisement that lasted 38 seconds.

Calculate the cost, correct to the nearest hundred dollars, for each second of the advertisement.

Answer \$ [2]

- (d) The programme showed an athlete running 100 metres, measured correct to the nearest metre.
The time the athlete took was 11.3 seconds, measured correct to the nearest 0.1 second.

Calculate the upper bound of the athlete's average speed.

Answer m/s [2]

- 41 The basic price of the 2016 model of a car is \$21 000.
Sayeed and Rasheed each buy this model of car.

(a) (i) Sayeed pays a deposit of \$756.

Calculate the deposit Sayeed pays as a percentage of the basic price.

Answer % [1]

(ii) He then pays 24 monthly payments of \$922.25 .

Calculate the **total** amount that Sayeed pays as a percentage of the basic price.

Answer % [2]

- (b) Rasheed pays a deposit of \$381 followed by 36 equal monthly payments.
The **total** amount that he pays is 127% of the basic price of \$21 000.

Calculate Rasheed's monthly payment.

Answer \$ [3]

- (c) \$21 000 represented an increase of 5% on the basic price of the 2015 model.

Calculate the difference between the basic prices of the 2015 and 2016 models.

Answer \$ [3]

- 42** Trevor has a collection of 54 toy vehicles.
Of these, 24 are cars, 12 are vans and the rest are trucks.

(a) Write the ratio of cars to vans to trucks in its simplest form.

Answer : : [2]

- (b)** Trevor decides that it is time to reduce his collection of vehicles.
He sells c cars, v vans and t trucks.
He finds that the ratio of cars to vans to trucks is now $2 : 2 : 1$.

Find c , v and t , given that he has sold

- at least one of each type of vehicle
- the smallest possible number of vehicles.

Answer $c =$

$v =$

$t =$ [2]

43 In 2016 Amira's income was \$36 720.

(a) This was 2% more than her income in 2015.

What was her income in 2015?

Answer \$ [2]

(b) In 2016, Amira used her income of \$36 720 in the following way.

\$12 000 was used for rent.

$\frac{2}{5}$ of her income was used for food and to pay bills.

15% of her income was spent on leisure.

The rest of her income was saved.

What percentage of her income did she save?

Answer % [4]

44 (a)

FLIGHTS TO SYDNEY

Cost per person: \$1199

ACCOMMODATION

Cost per adult per night: \$55

Cost per child per night: \$40

INSURANCE COVER FOR UP TO 20 DAYS

Cost per adult: \$40 and Cost per child: \$30

OR

Cost for family (2 adults and up to 4 children): \$155

A family of 2 adults and 3 children travel to Sydney for a holiday lasting 14 nights.

Calculate the **lowest total cost** of the flight, accommodation and insurance for their holiday.

Answer \$ [3]

(b)

BONUS CARS

\$42 per day for any mileage

VALUE CARS

\$20 per day **and** \$0.50 per mile

The family hires a car for 14 days and estimates their total mileage will be 750 miles.

Which company charges less for this hire and by how much?

Answer by \$ [3]

45 The table below shows the population, given to the nearest thousand, of some countries.

Country	Population in 2014	Population in 2015
Pakistan	185 133 000	188 169 000
China	1 393 784 000	1 402 007 000
South Korea	49 512 000	49 765 000
Thailand	67 223 000	67 438 000

(a) In 2015, how much larger was the population of Pakistan than the population of South Korea?

Answer [1]

(b) Which country had the smallest increase in population between 2014 and 2015?

Answer [1]

(c) Write the population of South Korea in 2014 in standard form.

Answer [1]

(d) Find the percentage increase in population of Pakistan from 2014 to 2015.

Answer % [2]

(e) The population of Cambodia in 2015 was 15 677 000.

Given that the increase in population from 2014 to 2015 was 1.68%, calculate the population of Cambodia in 2014.

Give your answer correct to 3 significant figures.

Answer [3]

- 46 (a) (i)** Jasmine earns \$12.50 for each hour she works.
She works for 38 hours each week.
She is given a pay increase of 6%.

Calculate the total amount Jasmine earns each week after the pay increase.

Answer \$ [3]

- (ii)** Abdul earns \$525 each week.
He moves to a new job where he earns \$462 each week.

Calculate the percentage reduction in his earnings in his new job.

Answer % [2]

- (iii)** Maria is given a pay increase of 3%.
After the pay increase, she earns \$2472 each month.

Calculate her monthly pay before the pay increase.

Answer \$ [2]

- (b) The exchange rate between dollars (\$) and pounds (£) is $\$1 = \pounds 0.65$.
The exchange rate between euros (€) and pounds is $\text{€}1 = \pounds 0.74$.

Dan changes €520 into pounds.
He spends £260 and then changes the rest into dollars.

Work out how many dollars he receives.

Answer \$ [3]

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4024/21/O/N/17

- 47 (a) Sara buys a new car.
The cash price of the car is \$4500.
She can pay for the car using option A or option B.

Option A	Option B
Pay $\frac{1}{5}$ of the cash price then 12 monthly payments of \$340	Pay 12% of the cash price then 24 monthly payments of \$195

Which option is cheaper and by how much?

Answer Option is cheaper by \$ [4]

- (b) Sara's car uses 5.2 litres of petrol for each 100 km she drives.
Petrol costs \$0.85 per litre.
Sara drives 240 km.

Calculate the cost of the petrol used for this journey.
Give your answer correct to the nearest cent.

Answer \$ [3]

- (c) Sara pays a total of \$322 for her car insurance.
This total is made up of a basic charge plus 15% sales tax.

Calculate the amount of sales tax that Sara pays.

Answer \$ [3]

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4024/22/O/N/17

- 48 (a) Sami invests \$2000 in an account paying compound interest at a rate of 1.8% per year.

Calculate the **total interest** paid to Sami after 3 years.

Answer \$ [3]

- (b) Theresa takes out a loan.
She repays the loan over one year at a rate of \$54 per month.
The total she repays is 8% greater than the value of the original loan.

Work out the value of the original loan.

Answer \$ [3]

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4024/21/M/J/18

- 49 (a) Each week Leah works 5 days and is paid a total of \$682.
Each day she works from 08 45 until 12 15 and then from 13 15 until 17 30.

Calculate Leah's hourly rate of pay.

Answer \$ [2]

- (b) Carlos buys a new bicycle.
After one year he sells it for \$231.
He makes a loss of 16% on the price he paid.

Calculate the price Carlos paid for the bicycle.

Answer \$ [2]

- (c) The exchange rate between dollars (\$) and euros (€) is $\$1 = \text{€}0.44$.
Henry changes \$850 to euros for his holiday.

He spends €260 when he is on holiday.

He changes the rest of the money back to dollars at the same exchange rate.

Calculate how much money in dollars he receives.

Give your answer correct to the nearest dollar.

Answer \$ [3]

- (d) Anya has \$3000 to invest in a savings account for 3 years.
She can choose from these two accounts.

Account A	
Year 1	1.1% interest
Year 2	1.2% interest added to end of Year 1 total
Year 3	1.4% interest added to end of Year 2 total

Account B	
Fixed rate of compound interest	
1.3% per year	

She chooses the account that will give her more money at the end of the 3 years.

Decide which account she chooses and find the amount she will have in her account at the end of 3 years.

Answer Account

\$ [4]

50 Dina owns a clothes shop.

(a) Maryam works in the shop.

She works for 5 days each week from 10 am until 6.30 pm.

She has a break of 45 minutes each day.

She is paid \$10.20 for each hour she works but she is not paid for her breaks.

Work out how much Maryam earns for one week's work.

Answer \$ [3]

(b) Dina buys 25 dresses from a manufacturer.

She pays a total of \$400 for these dresses.

She sells all the dresses for \$19.80 each.

Calculate her percentage profit.

Answer % [2]

(c) Dina sells a shirt for \$15.66 .

The price includes 8% sales tax.

Calculate the cost of the shirt excluding sales tax.

Answer \$ [2]

(d) Dina is saving to make improvements to her shop.

She invests \$3500 for 4 years at 1.7% per year compound interest.

Calculate the value of Dina's investment after 4 years.

Give your answer correct to the nearest cent.

Answer \$ [3]

- 51 (a)** Kamal earned a total of \$32 500 in 2017.
He paid 9% of this amount into his pension.
He paid 22% tax on the remainder of his earnings.

Calculate the amount left after paying his pension and his tax.

Answer \$ [3]

- (b)** Kamal invested \$1200 in a savings account paying 1.8% per year compound interest.
He left the money in the account for 5 years.

Calculate the amount of money in the account at the end of 5 years.
Give your answer correct to the nearest cent.

Answer \$ [3]

- (c) Kamal also invested some money in a different savings account for 5 years.
This account paid 2.1% per year **simple** interest.
At the end of 5 years there was \$828.75 in the account.

Calculate the amount of money he invested in this account.

Answer \$ [3]

- (d) The exchange rate between dollars (\$) and pounds (£) is $\$1 = \pounds 0.72$.
The exchange rate between dollars and euros (€) is $\$1 = \text{€}1.10$.

Kamal has \$275.

He changes part of the \$275 into pounds and receives £79.20.

He changes the remaining dollars into euros.

Calculate the amount of money he receives in euros.

Answer € [3]

52 In 2017, Lauren had a monthly income of \$1800.

(a) How much was her total income in 2017?

\$ [1]

(b) From her monthly income of \$1800, Lauren paid the following.

Rent	\$500
Bills	\$250
Food	\$120
Travel	\$240
Clothes	\$ 70

(i) Each month, Lauren saved the rest of her income.

What percentage of the \$1800 did she save?

..... % [3]

(ii) Lauren's monthly rent was increased by 3.6%.

Calculate the new monthly rent.

\$ [2]

(c) In 2017, Lauren's monthly income of \$1800 was 25% less than her monthly income in 2016.

Calculate her monthly income in 2016.

\$ [2]

53 The table below shows the cost to visit a zoo.

Adult	\$26.00
Child (Age 5 to 16)	\$15.50
Child (Under 5)	Free

- (a)** On 30th April, Mr and Mrs Ferugio and their three children aged 12, 8 and 3 visit the zoo.

What is the **total** cost for the family?

\$ [1]

- (b)** In May, the cost for a child is not changed.
The cost for an adult is reduced by $p\%$ to \$22.10.

- (i)** Calculate p .

$p =$ [2]

- (ii)** In May, the Ferugio family visit the zoo again.

Calculate the percentage reduction in the total cost from April to May.

..... % [3]

(c) The Ferugio family arrived at the zoo at 10.50 am.
They stayed at the zoo until 4.25 pm.

(i) How long, in hours and minutes, did they spend at the zoo?

..... hours minutes [1]

(ii) The zoo holds daily shows about different animals.

Daily Show	Time
Giraffe	10.00 am
Rhino	11.30 am
Hippo	12.30 pm
Tiger	1.45 pm
Lemur	3.00 pm
Crocodile	4.30 pm

The Ferugio family go to as many shows as they can during their visit.
Each show lasts 35 minutes.

How many minutes do they spend at these shows?

..... minutes [2]

54 Neema travels on a business trip.

- (a) The total cost of her flight is \$406 including tax.
The cost of the flight excluding tax is \$350.

Calculate the tax as a percentage of \$350.

..... % [2]

- (b) Neema takes a suitcase with mass 15.5 kg, correct to the nearest 0.5 kg.
She also takes 6 packets each with mass 1.2 kg, correct to the nearest 0.1 kg.
She has a luggage limit of exactly 23 kg for the flight.

Can Neema be certain that the mass of her luggage is below the limit?
Show how you decide.

.....
..... [2]

- (c) Neema changes \$245 to euros (€) for the trip.
The exchange rate is \$1 = €0.73.

On the trip she spends €124.
When she returns, she changes the remaining euros back to dollars at a rate of \$1 = €0.76.

Calculate the amount of money she receives.
Give your answer correct to the nearest dollar.

\$ [3]

- (d) On her next trip, Neema hires a car.
 She drives a total of 657 km in the car.
 The car uses fuel at a rate of 4.3 litres per 100 km driven.
 Neema pays \$1.29 per litre of fuel.

Calculate the amount she spends on fuel during the trip.

\$ [3]

- (e) Neema stays in a hotel for 7 nights.
 This is her hotel bill.

Item	Cost
7 nights at \$..... per night	\$805
4 dinners at \$..... each	\$.....
Total before tax	\$.....
Total including tax at 6.5%	\$996.84

Complete the missing values in the hotel bill. [4]

55 Tanya owns a small business.

- (a)** Tanya has 4 employees.

Every week, the employees each work for $7\frac{3}{4}$ hours each day for 5 days.
Each employee is paid \$15.20 per hour.

Calculate the total amount Tanya pays her 4 employees in one week.

\$ [2]

- (b)** The business made a profit of \$25 700 in 2017 compared with \$22 102 in 2018.

Calculate the percentage decrease in profit from 2017 to 2018.

..... % [2]

- (c)** Tanya must add 8% sales tax to the initial cost of a job.

She then adds 15% to the cost, including sales tax, to find the amount to charge a client.
Tanya charges one client a total of \$465.75 for a job.

Calculate the initial cost of this job.

\$ [3]

- (d)** Tanya invests \$8500 in an account paying 3.1% per year compound interest.

At the end of 5 years she takes \$9300 from the account to buy new equipment for the business.

Calculate how much money is left in the account after buying the new equipment.

\$ [3]

- 56** Anton invests \$6000 in an account for 5 years.
The account has a compound interest rate of 2.5% per year.
At the end of 5 years, he spends \$4200 of this money on a family holiday to Malaysia.

(a) How much money is left in the account?

\$ [3]

- (b)** Anton changes \$800 into Malaysian Ringgits (MYR) for his trip.
The exchange rate is $\$1 = 3.16 \text{ MYR}$.
He spends 2250 MYR and then changes the remaining money back into dollars (\$).
The exchange rate on his return is $\$1 = 3.27 \text{ MYR}$.

How many dollars does he receive on his return?
Give your answer correct to the nearest dollar.

\$ [3]

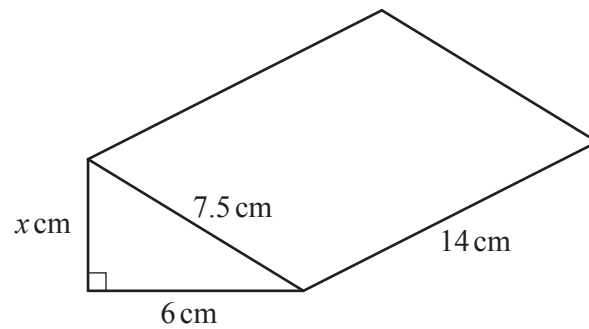
- (c) Anton invests \$1500 in another account.
The account has a compound interest rate of $p\%$ per year.
At the end of 3 years, there is \$1598.85 in the account.

Calculate p .

Give your answer correct to 2 decimal places.

$p = \dots\dots\dots [3]$

57 A company makes and packages chocolate bars.



This box contains a chocolate bar.
The box is in the shape of a triangular prism.

(a) Show that $x = 4.5$.

[2]

(b) These boxes are packed into cartons.
Each carton is a cuboid with internal dimensions 30 cm by 28 cm by h cm.
80 boxes fill one carton exactly.

(i) Calculate the value of h .

$h = \dots\dots\dots$ [3]

(ii) One day, the company packs 37 500 of these boxes into cartons.

How many complete cartons are packed that day?

$\dots\dots\dots$ [2]

(c) The company sells the chocolate bars to shops for \$0.70 each bar.

(i) The company makes 40% profit on each bar it sells.

Work out the cost to the company of producing each bar.

\$ [2]

(ii) A shop buys one carton of chocolate bars.

- They sell $\frac{3}{5}$ of the bars at a profit of 30% .
- They sell each of the remaining bars at \$0.84 .

Calculate the overall percentage profit made by the shop from selling all 80 bars.

..... % [5]

- 58** (a) Stefan had an annual income of \$21 500 in 2018.
His annual income increased to \$22 790 in 2019.

Calculate the percentage increase.

..... % [2]

- (b) Stefan invests \$1260 in a bank.
The bank pays simple interest at a rate of 2.5% per year.

Calculate the amount Stefan has in the bank at the end of 3 years.

\$ [2]

- (c) Stefan changes 4300 Indian Rupees (INR) into dollars (\$).
The exchange rate is \$1 = 67.8 INR.

Work out how much he receives.

Give your answer correct to the nearest dollar.

\$ [2]